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Representing Sensory Experience in Urban Design

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Abstract: The urban environment is clearly an experience for all the senses. This multi-modality is rarely accounted for in inscriptions of cities. Even architects with a rich approach to the senses continue to use traditional mapping and drawing techniques which are grounded in the visual. In developing our attitude towards designing for sensory multimodality, we have identified approaches in the notation of space and movement from the likes of Kevin Lynch, Rudolf Laban and Christopher Alexander. This response is measured against traditional forms of orthogonal representation of urban space. The study is further grounded by texts on the senses including Maurice Merleau Ponty, James Gibson, Joy Monice Malnar & Frank Vodvarka and Tim Ingold. We shall demonstrate the results of our notational systems, grounded in the practice and theory of urban design. The aim for this system of notation is to allow both multi-sensory description of urban space and multimodality in design. Such a notational system must respond to issues of urban scale and density as well as the needs of the design process itself, balancing carefully between utility and completeness of depiction. Questions of accuracy, legibility and application have been carefully considered in the production of a suite of representational techniques for urban designers, architects and others. All this offers a phenomenological representation of experience itself.

Keywords: Modality, Multi-Modality, Senses, Sensory Modality, Representation, Urban Design, Sound, Smell, Taste, Touch, Movement, Thermal, Kinaesthetic, Drawing, Notation, Synaesthesia, Space, Place

Introduction: The Case for Multimodal Design

THIS PAPER LOOKS at the representation of the senses within a specific design context: that of urban design. Urban design is a relatively new discipline, and is often associated with town planning and architecture. Urban design spans across a wide variety of scales, from the vast strategic scales such as the national and regional down to the most detailed scales involved with the design of street furniture and materiality. This project takes its cue from the scales suggested by the sense themselves, and works with a variety of medium-to-small scales as appropriate. The original remit of Urban Design was to consider the remainder between the concerns of architects on one hand and planners on the other. This set of concerns has broadened significantly in recent years, but our project maintains this original drive for Urban Design: the space between buildings, the public and private spaces that contribute to a lively civic realm. It is commonly accepted that a great deal of damage has been done to the urban environment by different forms of post-war development in the UK and other Western countries. Urban design looks to earlier precedents of cities and towns with a quality of urban space that contributes to a sense of civitas and belonging to the city as a whole. As such, the design of streets, squares and other public spaces are of crucial importance.

One thing that is true of urban design as a discipline is that it has a focus upon the visual sensory modality. Secondary to this is the aural modality, but this is often critiqued and understood, but rarely actually *designed* or *represented*.[1] The other sensory modalities, from the tactile sense, the sense of movement, the chemical senses of smell and taste, and the thermal sense are rarely considered in the design process in as informed a manner as the visual field. The bias towards the visual is a misrepresentation of experience as it neglects the emotional content of the non-visual senses. Given that the three components of environmental experience are perception, cognition and emotion, this is a significant deficit in the design process which oversimplifies experience for the sake of expediency. This is not to say that the senses have been neglected by urban theorists, but rather that methods of designing and representing these modalities have not been sufficiently developed. This project seeks to fill this need, and to allow urban designers to consider all sensory modalities within the design process. It is important to stress that his happens integral to the drawings and models that constitute the design process, and not some separate process that eventually informs the

[1] Consider, for example, the extensive literature on the concept of Soundscape initiated by R Murray Schafer (1994) and taken on further in the urban realm by Augoyard et al. at the CRESSON institute (2005).

established processes. This is due to the way in which drawing is a part of the thinking process itself, and not a later representation of an already complete and static idea.[2]

Gibson's Perceptual Systems in the Urban Environment

One of the fundamental questions that must be answered in this endeavor is: how do we conceptualize the senses at all? There is a long tradition of understanding the senses as divided and combined in a variety of ways, each time responding to the needs of the time. Each taxonomy[3] of the senses is loaded with meaning and far from neutral or given. Given the focus in our project of the urban realm, this should also be the focus of our taxonomy for the senses.

Constructing a taxonomy at all is, of course, problematic. This is most forcefully presented in Foucault's *The Order of Things* (1996), developing an archaeology of knowledge production itself. Crucial to this study is the section on *Mathesis and 'Toxinomia'* (1996: 71-77). Taxonomy, Foucault tells us, is reliant upon there being a continuum or non-discontinuity of things to allow the revelation of continuity in a taxonomy. The senses can be considered in this manner, as sufficiently non-discontinuous or even indivisible aspects of the same thing. It serves our purpose to divide the sensorium, whilst remaining mindful of the overlapping corroborative nature of perception, it is practical for our purposes to deal with the senses as separate but interlinked phenomena.

In this regard, the system described by James Gibson in his *The Senses Described as Perceptual Systems* is an attractive and useful alternative to the Classical Western five senses of seeing, hearing, smelling, tasting and touching.

Name	Mode of Attention	Receptive Units	Anatomy of the Organ	Activity of the Organ	Stimuli Available	External Information Obtained
The basic orienting system	General orientation	Mechano-receptors	Vestibular organs	Body equilibrium	Forces of gravity and acceleration	Direction of gravity, being pushed
The auditory system	Listening	Mechano-receptors	Cochlear organs with middle ear and auricle	Orienting to sounds	Vibration in the air	Nature and location of vibratory events
The haptic system	Touching	Mechano-receptors and possibly thermo-receptors	Skin (including attachments and openings), joints (including ligaments), muscles (including tendons)	Exploring of many kinds	Deformation of tissues, configuration of joints, stretching of muscle fibers	Contact with the earth, mechanical encounters, object shapes, material states, solidity or viscosity
The taste-smell system	Smelling	Chemo-receptors	Nasal cavity (nose)	Sniffing	Composition of the medium	Nature of volatile sources
	Tasting	Chemo- and mechano-receptors	Oral cavity (mouth)	Savoring	Composition of ingested objects	Nutritive and biochemical values
The visual system	Looking	Photo-receptors	Ocular mechanism (eyes with intrinsic and extrinsic muscles, as related to the vestibular organs, the head, and the whole body)	Accommodation, pupilary adjustment, fixation, convergence exploration	The variables of structures in ambient light	Everything that can be specified by the variables of optical structure (information about objects, animals, motions, events, and places)

Fig 1: The Perceptual Systems, Gibson, J. 1966:50

The main advantage of Gibson's understanding of the senses is that he understands them as perceptual systems rather than abstract concepts. Each sense is considered in terms of it's mode of attention, the receptors of that sense, the actual activity of sensing, the available stimuli and finally what is found out about the world. The senses are contextual, and cannot be considered outside of an environment. Gibson recognizes that all perception is perception *of* something, and perception *in* something. This is a point reinforced by recent anthropology of the environment (Ingold 2000) and phenomenology of perception (Merleau-Ponty 1997).

Gibson's system allows us to prioritize the perceptual systems slightly differently for our own needs: the olfactory sense and the gustatory sense are both understood as chemical senses, and very similar to one another in many ways. They have just as many

[2] See Lucas 2005 for a fuller discussion of this notion, that the inscriptive practice, be that diagram, notation or drawing is a process of thinking, a form of knowledge production in itself in which the manner of depicting and representing gives a framework to the development of an idea or concept. This idea is also developed substantially in Lacour 1996 and Ingold 2007.

[3] The systems of classification can vary in terms of their logic, creating a wide variety of responses to identical phenomena. Classifying the action of the senses as Gibson does, rather than as external phenomena available to be perceived, allows Gibson to present his case for active perception rather than passive reception of stimuli.

important differences too, of course. Whilst the gustatory sense is very important in a number of ways, it is diminished in our field of interest, as one does not often taste the urban environment directly. It is true that flavors can influence our experience of the city, the most obvious example being the various cuisines of the different quarters of the city. It is important to continue to recognize the role of taste in our notations, but allied with scent, its presence on the charts is enhanced beyond what it would be on its own.

Similarly, we take a cue from Gibson's own division of the senses commonly understood to be grouped under 'touch' with the *General Orienting System* and the *Haptic System*. These are concepts we shall retain, but also adopting the further split in the *Haptic System* in to the *Tactile* and *Thermal Systems*: both subsets of the same sensory system, but of such importance to the built environment as to justify greater presence in the diagram.

This re-ordering shows two of the advantages of our chosen diagram: flexibility and relevance. The sensory taxonomy we are using is a function of our understanding of the urban environment in exactly the same way as any drawing practice is a function of our understanding of form and space. Should a different understanding be required, an alternative framework for the senses can easily be substituted for the one we are proposing here.

Urban Design Representation

The problem of how to represent urban space has been tackled in a number of different ways over the years. The complexity of urban environments does call for innovative means of representation, forms of depiction that allow for the experience of the spaces between buildings and the interplay of public and private are extremely important both to represent and to the design of urban spaces. The form this representation takes embodies a theory about space itself: representation is far from neutral, and carries with it an accumulated body of knowledge and understanding of space. All of these systems offer alternatives rather than definitive representations of space, and the differences between the conceptualizations of space offered are useful tools rather than awkward throwbacks.

Giambattista Nolli's 1748 map of Rome is a conventional starting point for urban space representation. This map is widely recognized to be a significant move forward in understanding urban space, as the map concentrates upon the interaction of public and private space. The importance of Nolli's ichnographic plan of the city was to move away from pictorial depictions, and to render the relationships between objects and spaces in a measurable way. Additionally, the dense private space of building interiors was shaded, leaving the public space as white on the paper. This positive and negative space has had a substantial impact upon architectural and urban design thinking, and the Nolli map remains a useful tool for analyzing urban space as well as being useful in the design process.[4] Nolli himself added topographical details as well as features such as fountains, sewerage systems and historical traces such as the Aurelian wall, some ancient monuments were depicted as ruins and others posited.[5]

In his essay, *The Developed Surface: An Enquiry into the Brief Life of an Eighteenth-Century Drawing Technique*, architectural theorist Robin Evans explores a curious development in section drawing, which, although largely used for interiors, does further demonstrate the relationship between *how* one draws something and how one understands it. I also include this to illustrate that I do not understand the progress or development in drawing techniques to be a straight line of improvement and progress, with each new form of representation understood as superior to its predecessors. Indeed, I would reject such pejorative terminology altogether with regards to representation, preferring instead to understand that the representation is designed to fit the needs of the draughtsman. This supports our own activity in *designing* new notations, exposing the workings of such activities and how they can become deeply entrenched in our design processes, such as orthographic representations or computer models have – and how some representational techniques such as this form of folded-out interior section have fallen by the wayside. As we shall see later, some forms of notation can remain contentious, as is the case with Laban notation in ballet and modern dance.

> 'Produced between 1817 and 1832, they illustrate proposals for various interiors, for the most part drawing rooms. Gillows, then still in the forefront of the trade, understood the new mode of furnishing very well and their catalogue contained free-standing pieces that colonized open floorspace as well as a range of traditional wall-hugging items. Yet their design drawings, presumably meant for clients, indicate a dislocation between the recognized technique of representing interiors and the altered geography of the floor. They needed to show the walls because some of their merchandise still belonged there. For that the developed surface was the obvious choice. They needed also to show each item of potential purchase, whatever its position,

[4] The University of Oregon have made the plan available online at http://nolli.uoregon.edu/default.asp .
[5] Ceen, A & Tice, J. 2005. *The Nolli Map as Artifact*. *http://nolli.uoregon.edu/artifact.html*

> in sufficiently pictorial a form, and they needed to show their combined effects on the room as a whole. They ended up conflating three distinct types of drawing in a vain attempt to illustrate the topography of the floor and the flatness of the walls in one summary representation. The old technique of folding the walls outward is trundled out unflinchingly to satisfy one part of the requirement. At the same time, small-scaled perspectives of the disengaged chairs, couches, footstools, card- and dining-tables float in the maelstrom of conflicting imagined spaces, each piece contributing its own idiocentric and cock-eyed cone of vision.' (Evans, R 1997:219-221)

I would draw different conclusions from those inferred by Evans here, which are quite critical of the disparity and chaotic effect of this composite drawing technique. I would instead look to the economic imperative driving the representation, and the success this form has in describing the items of importance to this endeavor. Despite the 'directly adjacent objects being frequently upside-down or sideways in relation to each other' the overall effect is to depict a room and its furnishings. Testing this against some photo-realistic representation is a false comparison, and photography comes out wanting as well as the furniture drawing. In terms of what the drawing seeks to achieve, it is very successful, and it is *every bit as realistic on its own terms*, pictorially depicting each element with an orientation related to its position in the room rather than an abstract picture plane and viewer. Indeed, Evans' critique is predicated upon contemporary assumptions regarding viewing the drawing as a static object, whilst these sections must be manipulated and rotated by hand – the very engagement with the artifact itself is on different terms.

Further insight into this issue of representation and understanding can be gleaned from Claudia Brodsky Lacour's work relating Descartes and architectonics. Lacour contrasts pictoriality and linearity, that the line which forms part of a representation, a line which stands for something observed, is of a different order to a line which is an object in itself. The Modernist project itself can be said to lie within this very difference, the absence of a metaphorical role for the line.

> 'But in Descartes, the modern, the drawing of a line from an "imagination" free of imaged forms, must take place by way of discourse, writing which conceals its own status as line in its intelligibility as representation.' (Brodsky Lacour, C 1996:8)

This lack or absence allows for the very function of design itself, and firmly implicates this objectified line in the practice of designing.

This attitude presents us with some problems, of course. One of the problems with this approach to lines, drawing and design is that it allows no room for descriptive lines other than these discursive lines that *are only lines* and not translations of the perceived environment onto an inscribed surface. Descartes conflates *drawing* with design, opposing it to the category of *painting* which can only depict existing things by his understanding. This false dichotomy is challenged by later thinkers such as Merleau-Ponty (see Brodsky Lacour 1996:142), who finds that the painted line can have the quality of pure line as well as its metaphorical and representational value - standing in for something observed.

What remains from Descartes, however, is a strong argument that line equals discourse, that line can posit things not yet seen: to enable design as well as to describe things already existing. The discourse, the theory, is held in the line as much as in the text, and the notational system is a framework for this thought.

The work of British urbanist Gordon Cullen is a case in point, and has been criticized on the basis of its focus on the picturesque in the Townscape. This is to miss a crucial point in his representational technique, however, which closely resembles a storyboard from cinematic production design: and that is the movement through space, the kinaesthetic sense engendered by his *serial drawings*. Cullen encourages us to draw spaces as a sequence of perspectives taken along a typical route through space. Cullen's series of drawings allow the site to be analyzed in terms of the perception of the urban environment, the ways in which spaces reveal themselves to a walker, qualities of juxtaposition, continuity, surprise, progression, and many more temporal metaphors. Cullen can be contrasted with Lynch, as we shall see below. Both are concerned with legibility in urban environments, but the substantial differences in their theory can be observed in the means of representation chosen. This is not to say that Cullen and Lynch differ only in their form of representation, but rather that the substantial differences between their overall theories of urbanism are clearly illustrated by their chosen forms of inscriptive practice. The differences in drawing clearly reflect the differences theoretically. Cullen's theory of urban design rests upon the unique nature of a place, the amount of interest and variety in that place, and the sense of progression through spaces that is given by framing views, careful variation in enclosure and so on. This is with reference to pre-modern towns and cities rather than the post-war planning that he railed against so much. A positive value is placed on the picturesque by Cullen, and he is open to that criticism, but the kinaesthetic or even cinematic sense is even stronger in his work.

The contrast between Lynch and Cullen is marked. Kevin Lynch wrote extensively on urban design from the point of view of legibility. This conceptualization of the city and town is concerned with the logic and sense that the city makes to its inhabitants. Lynch's most influential work, *The Image of the City* offers a notational system for this theory, which layers information on top of conventionally rendered city plans. These notations seek to break the urban experience into basic elements such as paths, edges, nodes, districts and landmarks. These elements can be further described in terms of weakness or strength, and have a spatial extent depicted on the plan drawings. Lynch's methodology was related more to the social sciences and psychology than the individualistic efforts of Cullen. Lynch used multiple respondents, residents of the city and districts he was interested in, and compiled their results to generate a more complete picture of each environment. Further diagnosis of urban problems could be made by examining the quality of each path, edge, node, district and landmark: always with reference to these abstract concepts, defining an edge as weak, a landmark as missing, and so on. The difference in representation between Cullen and Lynch is particularly telling of their difference in urban theory. Cullen is very much concerned with the individual experience, an almost phenomenological attitude towards space that exploits the single viewer of the perspective drawing. Lynch, on the other hand, prefers the top-down plan, with its infinite viewing distance rendering everything equal in the gaze. This gaze is then turned to the relations between things, and referred to this abstract (and no less accurate for that) system of qualities.

The form of representation we choose to use for the urban environment tells us a great deal. It influences our theory of the urban fundamentally. Given my task of designing a notation for the sensory experience of urban space, this gives a far greater importance to the very form that notation takes.

Testing the Notation, Organizing Perception

The notational system itself is only one part of the process, of course. Perception is, according to Gibson, an active process – one which relies upon attention.

> 'The channels of sense are not subject to modification by learning. The data of sense are *given*, by definition. The perceptual systems, however, are clearly amenable to learning. It would be expected that an individual, after practice, could orient more exactly, listen more carefully, touch more acutely, smell and taste more precisely, and look more perceptively than he could before practice.' Gibson (1966:51).

Organizing and giving form to this attention is crucial to the process, much like the attention given to the visual modality by an artist sketching, or the aural focus of a sound designer making field recordings. This process of perception is parallel to the practice of notation. The following is being tested with the collaboration of groups of senior undergraduate and Masters students in a variety of disciplines from architecture, urban design, product design, anthropology and sound design.

These workshops focus on the radar diagram method described above, but in a structured way. The notations were conducted in two main ways. First of these was recording a route by taking a reading at either each traffic intersection or at specific timed intervals. The second notations were static recordings of a fixed place such as a square. Several sites around this place are recorded and plotted on a plan.

The notation progresses in the following order:

- **Location**: plot the site being recorded, whether a part of a route or a static position. Details such as time, date and weather may also be included.
- **Descriptor**: use a word from the list given to characterize each of the six perceptual systems: visual, aural, olfactory/gustatory, tactile, thermal, kinaesthetic.
- **Priority**: draw a line on the chart corresponding to the priority given to that perceptual system in this context.
- **Corroboration**: indicate how the senses overlap.
- **Temporality**: indicate the repetition, singularity, etc. of the observations.

By locating the site on a traditional drawing such as a plan or section, the notational scheme can be understood as a layer or transparency added to traditional modes of depicting urban spaces. This is an important step, as it identifies the process as part of the traditional toolkit, rather than completely alien to it. Additional information such as time, date and weather conditions are necessary for the future usefulness of the record, as the sensory data vary widely depending upon the time of day or the season.

The next step is to place a descriptor word on each of the six perceptual systems employed by the notation. These are chosen from a restricted and carefully selected list of words for each sense. There are dangers as well as advantages to this approach. By constructing a common vocabulary of tightly defined terms, the aim is to allow designers and others including clients to communicate with one another. Of course language as much as any inscriptive practice is loaded with hidden, even unintended meanings,

and opens the notation to the critique that the results are influenced by the research team. The terms are chosen for their clarity and lack of metaphorical content. This precision of language finds its roots in Laban notation's *Effort* and *Shape* matrices, where a very tight use of language helps to describe quite complex movements. Similarly, a lesser known system of dance and movement notation, Saunders Notation[6] utilizes a matrix of words which can be selected and connected in a variety of ways. Additionally, names of things causing particular sensations such as traffic or wind may be added if the notator feels it necessary. This adds an extra level of description and helps to avoid confusion. The issue of coloring the results of the notation by supplying words is an issue for the training of notators, as it is in Laban notation. A commonly understood definition can be reached for the descriptor terms within the context of the notation and used as a helpful shorthand. Indeed, language and text consistently comes up as an ideal medium for describing sensory experiences due at least in part to its deep entrenchment within our culture.

DESCRIPTORS

VISUAL	AURAL	TACTILE	KINETIC	THERMAL	CHEMICAL
Dark	High Pitch	Static	Strong	Hot	Weak
Bright	Low Pitch	Mobile	Light	Cold	Intense
Saturated	Quiet	Rough	Free	Dry	Stagnant
Neutral	Loud	Smooth	Bound	Wet	Fresh
Perspectival	Clear	Light	Indirect	Natural	Musky
Flat	Reverberant	Heavy	Direct	Artificial	Putrid
Intimate	Vocal	Porous	Level	Ambient	Floral
Vast	Non-Vocal	Resistant	Graded	Source	Fruit
Solid	Natural	Hard	Sustained	Radiant	Spice
Void	Artificial	Soft	Quick	Convective	Resin
Detailed	Attack	Warm	Crowded	Constant	Meaty
Blank	Decay	Cold	Empty	Responsive	Oily

Fig 2: Table of Descriptor Terms for Sensory Notation

The third step in the notation is the main graphic step: priority. This step is subjective by its very nature, but it offers a strong picture of each environment as well as suggesting immediate ways in which the environment may be changed. This step consists of deciding which senses are strongest, most affective and prominent. The senses are then ranked in order of priority. This is drawn in an order of priority rather than introducing artificial constructs such as the percentage of the sensorium devoted to that sense. The Radar chart is drawn with numbers from 1 to 6, outside to inside. The highest priority is placed at one, the least at six. There is flexibility within this, of course, allowing some senses to be placed at the same rank as each other, or the gulf between two perceptual systems to be depicted as larger or lesser as appropriate.

[6] See Guest (1989) for more details on various forms of dance notation including Saunders notation from 1946.

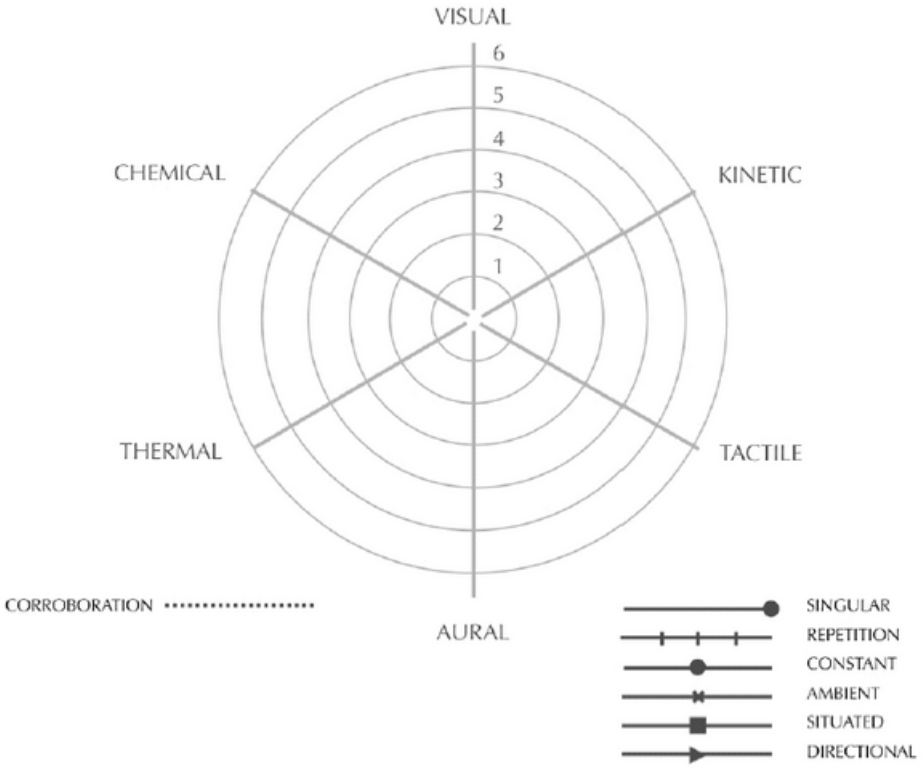

Fig 3: Radar Diagram for Sensory Notation System Including Notations for Temporality and Sensory Corroboration

The next step is to depict the corroboration between the senses by using curved, dotted lines between the different senses. These lines can contain a variety of data about this relationship, but the main thrust is to efficiently describe where these overlaps occur without overloading the diagram.

The final step recognizes the temporality of the senses, and adds indications to the main Radar diagram lines of the quality of time inherent to that sense. This can be persistent, repetitive, singular, rhythmic or intermittent. This notation is not necessarily timed using chronological time, but rather recognises the phenomenological basis of the notation. The conceptualization of time in this regard is experienced time rather than the clock time of the physical sciences.

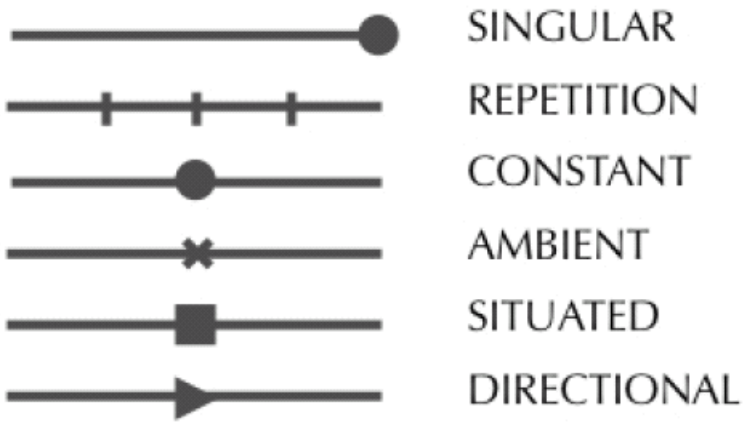

Fig 4: Temporal Modifiers Applied to Radar Diagram Lines in Sensory Notation

The diagrams are collected and analyzed in a number of different ways. The route notations can be layered, showing the progress along a path through transparency. This allows the route to be understood in terms of how the senses change from one position along the path to another. This can aid in identifying the prominent sensory stimuli on each route, where there are deficits, and what makes this trail unique in character. Similarly, the static locations can be reviewed and understood, particularly where a body of people have taken a record of the same place under similar conditions.

These observations are collated, so that patterns may emerge. These patterns are understood in the same way as Christopher Alexander's *Pattern Language* (1978) with a different slant: the sensory experience of place. Of course, Alexander's work has been deployed differently by a variety of academic disciplines over the years. One example is the adoption of his work by computing science as a model for how creativity and design works. This is a false picture, however, and is attractive to that discipline precisely because it is easily understood through computational models. Other uses have included rather reactionary movements in urbanism which use Alexander's patterns as a justification for pursuing a purely historicist agenda, rejecting everything the 20th Century and Modernism had to offer. This is not to devalue Alexander's approach of course, as it certainly has its place and is of intense interest. A new pattern book is being assembled using the Sensory Notation method, not as absolute models, but as suggestions and examples to be played with and designed with freely, but in an informed way.

By way of example, I would like to present works by postgraduate students at the Department of Architecture, Strathclyde University. The students in question are pursuing their Diploma and Masters level projects in Advanced Architectural Design and Urban Design.

On a recent field trip to the former industrial cities of the Ruhr valley in Germany, the students were set a task based on the Sensory Notation system. The task was simple: to record two locations and two routes using Sensory Notation, and to supplement this with a 500-1000 word written account of a sensory experience from each day of the 4-day trip. The text was to be written as flatly and plainly as possible, following the example of Georges Perec:

> 'Observe the street, from time to time, with some concern for system perhaps.Apply Yourself. Take your time.Note down the place: the terrace of a café near the junction of the Rue de Bac and the Boulevard Saint-Germain the time: seven o'clock in the evening the date: 15 May 1973 the weather: set fair Note down what you can see. Anything worthy of note going on. Do you know how to see what's worthy of note? Is there anything that strikes you? Nothing strikes you. You don't know how to see. You must write about out it more slowly, almost stupidly. Force yourself to write down what is of no interest, what is most obvious, most common, most colourless.' (Perec, G. 1997:50 my emphasis) 'force yourself to see more flatly' (Perec 1997:51 my emphasis)

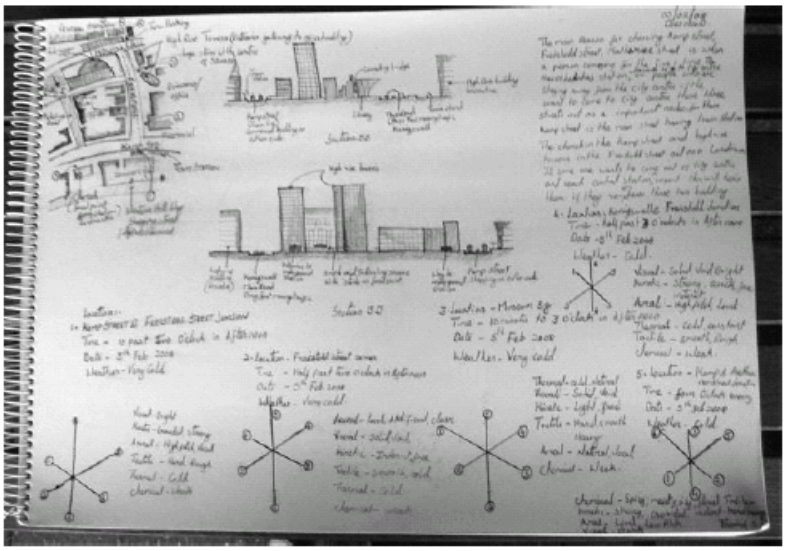

Fig 5: Notation of a Square in Dortmund City Centre

The notation proved remarkably flexible, and several practical considerations of the notation emerged, such as the difficulty of drawing notation over a plan or section and the preference for placing numbered markers on the base drawing, with notations placed to the side of this.

Moving between plan and section drawings was extremely important to the notation, and this was a decision which reflected the students' understanding of the space. Routes were often understood in section rather than plan, underlining the three-dimensional and volumetric nature of the route. Static places on the other hand were commonly rendered in plan. This allowed a number of positions around the space to be plotted and recorded using the notation. The relative positions were recorded on the plan, where the section is presented as a progression through space.

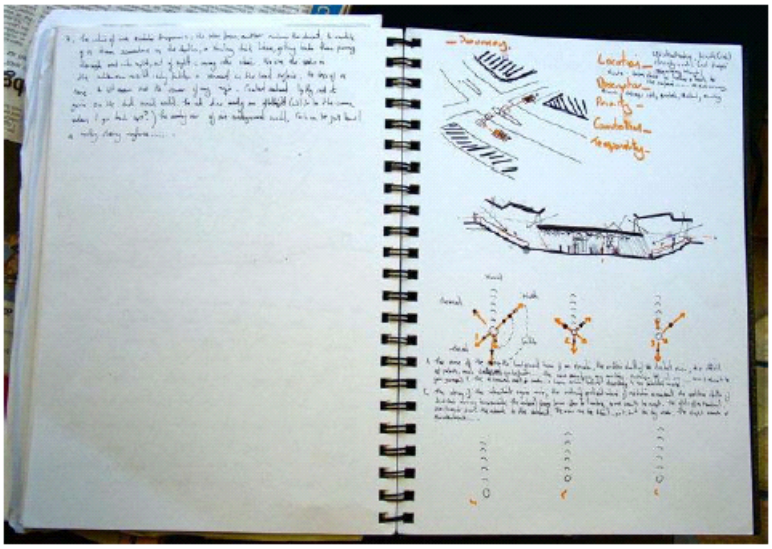

Fig 6: Notation of a Subway in Dortmund

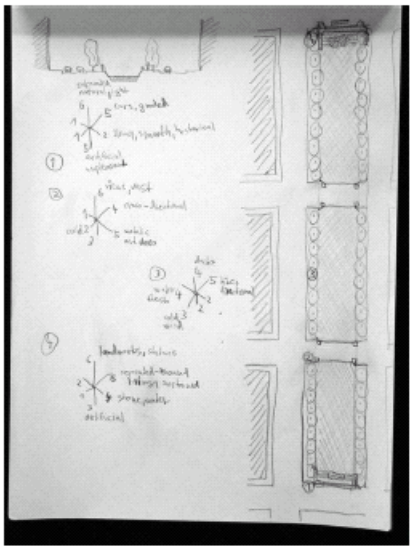

Fig 7: Notation of a Canal and Streetscape in Dusseldorf

Conclusions

Discussions with the students reveal the notation to be a simple and powerful tool for reinforcing and recording the experience of being in a place. The field trip is an ideal place to test this research question, as a new environment is often approached with a heightened sense of attention, an attention which lends itself well to the recording of that place. The aim of these recordings is to build a library of experiences which the designers may draw upon in their work.

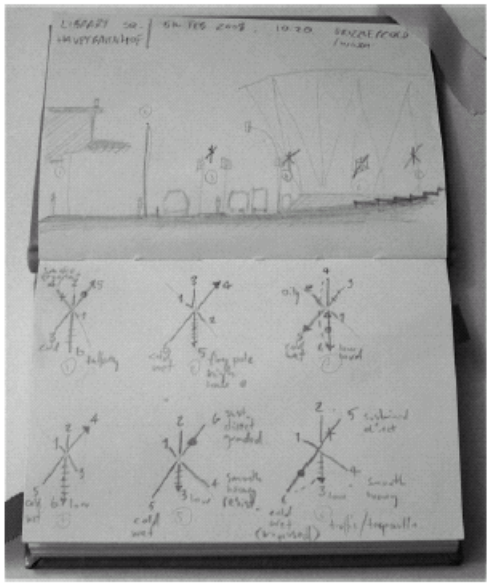

Fig 8: Author's Own Notation of Dortmund Hauptbahnhof, Showing the Journey to the Station in Wet and Windy Conditions

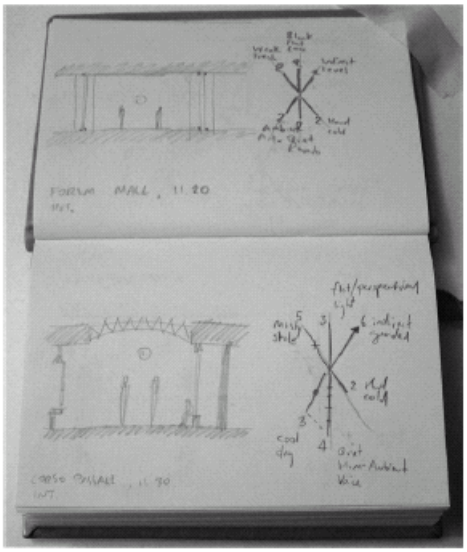

Fig 9: Author's Notation of Two Different Arcades in Dortmund, One of which is a Deadened and Sterile Environment Scoring '2' for Each Sense Whilst the Other is a Rich Combination of Experiences

Architects and Urban Designers often rely upon their reminiscences and memories of successful places encountered elsewhere: leading by example. Many elements of this experience are lost, however, as the designer is not equipped with a means to record the many layers of sensation that build up to form a complete environment. This multi-modal approach is afforded by the Notational System presented above.

By documenting the experiences of places oneself and with reference to pattern books published by the Multimodality research team, the designer shall be better equipped to face the challenge of designing for all the senses.

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Dr. Raymond Lucas is currently researching 'Multimodal Representations of Urban Space' at the departments of Architecture and Building Science and Design, Manufacture & Engineering Management, University of Strathclyde. The research is part of the AHRC/EPSRC Designing for the 21st Century cluster. This project looks at the broad range of sensory experience and looks to find notations appropriate to this fuller description and design of urban space. Lucas has also been involved in research on the extent of the human voice in determining space at the university of Edinburgh. The Inflecting Space project was a collaboration between architecture and music supported by the AHRC looking at applications of sound design to public space.Lucas has a PhD in social anthropology from the University of Aberdeen with the thesis 'Towards a Theory of Notation as a Thinking Tool'. This work examined creative inscriptive practices ranging from architectural drawing through movement notations to diagrams and painting. The thesis formed part of the AHRC Creativity and Practice Research Group. Lucas also has an MPhil by research on the topic of 'Filmic Architecture', and conducted research on the documentary pioneer John Grierson for the Scottish Cultural Resources Access Network.

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